The 20th International Symposium on Molecular and Neural Mechanisms of Taste and Olfactory Perception (ISMNTOP/YRUF/AISCRIB 2023)

第20回国際シンポジウム“味覚嗅覚の分子神経機構”

（併催：うま味若手フォーラム2023,
アジア国際シンポジウム“化学受容と摂食行動”2023）

Organizer:

Yuzo Ninomiya
Okayama University, Japan
Kyushu University, Japan
Monell Chemical Senses Center, USA

Ryusuke Yoshida
Okayama University, Japan

Program & Abstracts

November 25-26, 2023
Junko Fukutake Hall, Okayama University,
2-5-1, Shikata-cho, Kita-ku, Okayama, 700-8525, Japan

Hosted by

Department of Oral Physiology,
Graduate School of Medicine, Dentistry and
Pharmaceutical Sciences, Okayama University

岡山大学大学院医歯薬学総合研究科口腔生理学分野

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Japanese Association for the Study of Taste and Smell (JASTS)
Umami Manufacturer's Association of Japan
Ajinomoto Co., Inc.

Organizing Committee

Yuzo Ninomiya (Okayama University/Kyushu University, Japan/ Monell Chemical Senses Center, USA)
Masahiro Yamaguchi (Kochi University, Japan)
Takeshi Imai (Kyushu University, Japan)
Atsuko Yamashita (Okayama University, Japan)
Yoko Masuzawa (Ajinomoto Co. Inc., Japan)
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https://www.okayama-u.ac.jp/user/oralphys/ISMNTOP/ISMNTOP.html

The 20th International Symposium on Molecular and Neural Mechanisms of Taste and Olfactory Perception (ISMNTOP2023, YRUF2023, AISCRIB2023)

November 25th, Saturday ----------

■ Opening remarks 12:50 - 13:00
Ryusuke Yoshida (*Okayama Univ*)

■ Session I 13:00 – 15:20
Memorial session for Dr. Kunio Torii
[Chair: Yuzo Ninomiya *(Okayama Univ, Kyushu Univ, Monell Chem Senses Cent*), Ken Iwatsuki (*Tokyo Univ Agriculture*)]

IS1-1 13:00 - 13:10
Introduction
Yuzo Ninomiya
Okayama Univ, Kyushu Univ, Japan; Monell Chemical Senses Center, USA

IS1-2 13:10 - 13:35
Gut Umami Sensing Hypothesis：A Short History and Perspectives
Hisayuki Uneyama
Science Group, Global Communications Department, Ajinomoto Co., Japan

IS1-3 13:35 - 14:00
Umami: the long journey of the 5th basic taste
Ana San Gabriel
Science Group, Global Communications Department, Ajinomoto Co., Japan

IS1-4 14:00 - 14:25
Turning of umami research: shift from defense (safety) to offense (physiological significance)
Takashi Kondoh
Department of Food Science and Nutrition, Faculty of Agriculture, Kindai University, Japan

IS1-5 14:25 - 14:50
Studies of endoderm-derived chemosensory cells using organoid culture system
Ken Iwatsuki
Department of Nutritional Science and Food Safety, Faculty of Applied Biosciences, Tokyo University of Agriculture, Japan

IS1-6 14:50 - 15:20 (special talk)
L-ornithine and GPRC6A may be a novel kokumi substance and a kokumi receptor
Takashi Yamamoto
Department of Nutrition, Kio University, Japan

▶ Break **15:20 - 15:40**

■ Session II 15:40 – 16:55
Taste Receptor
[Chair: Hiroo Imai (*Kyoto University*), Atsuko Yamashita (*Okayama University*)]

IS2-1 15:40 – 16:05
Unique preference for the specific foods in primate species based on the molecular properties of receptors
Hiroo Imai
Center for the Evolutionary Origins of Human Behavior, Kyoto University, Japan

IS2-2 16:05 – 16:30
Chemical range recognized by the ligand-binding domain of medaka T1r2a/T1r3
Hikaru Ishida[1], Yuri Kuhara[2], **Atsuko Yamashita[1,2]**
[1]Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, [2]School of Pharmaceutical Sciences, Okayama University, Japan

IS2-3 16:30 – 16:55
Elucidation for the activation/inactivation dynamics of the sweet taste receptor
Keisuke Sanematsu[1,2,3], Masato Yamamoto[1], Yuki Nagasato[1], Yuko Kawabata[1], Shingo Takai[1], Noriatsu Shigemura[1,3]
[1]Section of Oral Neuroscience, Graduate School of Dental Science, Kyushu University, Japan, [2]Oral Health/Brain Health/Total Health Research Center, Graduate School of Dental Science, Kyushu University, Japan, [3]Research and Development Center for Five-Sense Devices, Kyushu University, Japan

■ Poster session 1 16:55 - 18:15

■ Bus transportation 18:30 -

■ Short Talk Session & Social Gathering 19:00 – 21:00
@ REST&EVENT HALL FORTEEN
2nd basement, Central building, 6-36, Honmachi, Kita-Ku, Okayama

November 26th, Sunday ----------

■ Session III 9:00 - 10:40

Olfaction

[Chair: Masahiro Yamaguchi *(Kochi Univ*), Takeshi Imai (*Kyushu Univ*)]

IS3-1 9:00 – 9:25

Antagonistic interactions between odorants influence human odor perception

Yosuke Fukutani[1], Masashi Abe[1], Haruka Saito[1], Toshiaki Tazawa[2], Ryo Eguchi[2], Masafumi Yohda[1], Hiroaki Matsunami[3]

[1]Department of Biotechnology and Life Science, Tokyo University of Agriculture and Technology, Japan, [2]Research Section, R & D Division, S.T. Corporation, Japan, [3]Depertment molecular genetics and microbiology, Duke University School of Medicine, NC, USA

IS3-2 9:25 – 9:50

Contribution of RNA binding proteins in axon targeting and maturation of olfactory sensory neurons

Nanaho Fukuda

Brain Research Institute, Niigata University, Japan

IS3-3 9:50 – 10:15

Mechanisms of synaptic competition for establishing the "one mitral cell – one glomerulus" connection rule

Satoshi Fujimoto[1], Marcus N. Leiwe[1], Shuhei Aihara[1], Richi Sakaguchi[1], Yuko Muroyama[2], Reiko Kobayakawa[3], Ko Kobayakawa[3], Tetsuichiro Saito[2], Takeshi Imai[1]

[1]Graduate School of Medical Sciences, Kyushu University, Japan. [2]Department of Developmental Biology, Graduate School of Medicine, Chiba University, Japan. [3]Institute of Biomedical Science, Kansai Medical University, Japan.

IS3-4 10:15 – 10:40

Neuronal migration depends on blood flow in the adult olfactory bulb

Takashi Ogino[1], Akari Saito[1], Masato Sawada[1,2], Shoko Takemura[1], Jiro Nagase[1], Honomi Kawase1, Hiroyuki Inada[3], Vicente Herranz-Pérez[4, 5], Yoh-suke Mukouyama[6], Masatsugu Ema[7], José Manuel García-Verdugo[4], Junichi Nabekura[3], Kazunobu Sawamoto[1, 2]

[1]Department of Developmental and Regenerative Biology, Nagoya City University Graduate School of Medical Sciences, Japan, [2]Division of Neural Development and Regeneration, National Institute for Physiological Sciences, Japan, [3]Division of Homeostatic Development, Department of Developmental Physiology, National Institute for Physiological Sciences, Japan, [4]Laboratory of Comparative Neurobiology, Cavanilles Institute, University of Valencia, Valencia, Spain, [5]Department of Cell Biology, Functional Biology and Physical Anthropology, University of Valencia, Spain, [6]Laboratory of Stem Cell and Neuro-Vascular Biology, Cell and Development Biology Center, National Heart, Lung, and Blood Institute, National Institutes of Health, USA, [7]Department of Stem Cells and Human Disease Models, Research Center for Animal Life Science, Shiga University of Medical Science, Japan.

▶ Break **10:40 - 11:00**

■ Special lecture 1 11:00 - 11:40

[Chair: Masahiro Yamaguchi *(Kochi Univ*), Takeshi Imai (*Kyushu Univ*)]

How do mammalian odorant receptors recognize odorants?

Hiro Matsunami

Duke University, USA

■ Lunch & Poster session 2 11:40 - 12:40

■ Special lecture 2　　12:40 – 13:20

[Chair: Tadashi Inui (*Hokkaido Univ*)]

How Sweet it is: Metabolic and Hedonic Aspects of Oral Sugar Sensing
Lindsey A. Schier
Department of Biological Sciences, University of Southern California, USA

Break **13:20 - 13:30**

■ Session IV　　13:30 – 15:20

Asian International Symposium on Chemo-Reception and Ingestive Behavior 2023 (AISCRIB2023)

[Chair: Seok Jun Moon *(Yonsei Univ*), Akiyuki Taruno (*Kyoto Pref Univ Med*)]

IS4-1　13:30 – 14:00 (special talk)
The Function of Glial Odorant Receptors in Neuroinflammation
ChaeEun Lee[1,2], Su-Jeong Kim[1,2], Jiwoo Choi[1,2], TaeHo Cho[1,2], Jiyoun Lee[3], Jae-Yong Park[3], Ho Lee[4], Dae Gun Kim[5], Sehyun Chae[6], **JaeHyung Koo[1,2,6]**
[1]Department of New Biology, DGIST, [2]New Biology Research Center (NBRC), [3]School of Biosystem and Biomedical Science, Korea University, [4]Research Institute, National Cancer Center, [5]Department of Biological Sciences, KAIST, [6]Korea Brain Research Institute (KBRI), Republic of Korea

IS3-2　14:00 – 14:30 (special talk)
The circuit mechanism that links brain sugar-sensing to peripheral nociceptive gating in *Drosophila*
Kazuo Emoto
Department of Biological Sciences, International Research Center for Neurointelligence (WPI-IRCN), The University of Tokyo, Japan

IS3-3　14:30 – 14:55
Role of the central nucleus of the amygdala in behavioral expression on retrieval of conditioned taste aversion memory
Tadashi Inui
Department of Oral Physiology, Graduate School of Dental Medicine, Hokkaido University, Japan.

IS3-4　14:55 – 15:20
SNAP-25 contributes to the maintenance of Type III taste receptor cells
Kengo Horie[1], Hai Huang[1], Kuanyu Wang[1], Yu Zuo[1], Keiko Yasumatsu[2,3], Yuzo Ninomiya[1,3,4], Yoshihiro Mitoh[1], Ryusuke Yoshida[1]
[1]Department of Oral Physiology, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University, Japan, [2]Tokyo Dental Junior College, Japan, [3]Monell Chemical Senses Center, USA, [4]Oral Science Research Center, Tokyo Dental College, Japan

Break **15:20 – 15:30**

■ Session V　　15:30 – 16:45

Transporters, ion channels and GPCRs involved in chemosensory signaling

[Chair: Mamiko Ozaki (*Kobe Univ/Nara Women's Univ*),　Satoshi Wakisaka (*Kansai Women's College*)]

IS5-1　15:30 – 15:55
Warm-activated TRP channels regulate oral epithelial regeneration
Reiko U. Yoshimoto[1], Reona Aijima[2], Yasuyoshi Ohsaki[1], Takeshi Sawada[1], Ailin Cao[1], Weiqi Gao[1], Mizuho A. Kido[1]
[1]Division of Histology and Neuroanatomy, Dept. of Anatomy and Physiology, Fac. Med., Saga Univ., Japan, [2]Dept. of Oral and Maxillofacial Surgery, Fac. Med., Saga Univ., Japan

IS5-2 15:55 – 16:20

Impaired Pheromone Perception and Abnormal Sexual Behavior in ancV1R Deficient Female Mice

Hiro Kondo[1], Tetsuo Iwata[1,2], Riseru Koshiishi[1], Hikoyu Suzuki[3], Ken Murata[4], Kazushige Touhara[4], Masato Nikaido[1], Junji Hirota[1,2]

[1]Department of Life Science and Technology, School of Life Science and Technology, Tokyo Institute of Technology, [2]Center for Integrative Biosciences, Tokyo Institute of Technology, [3]digzyme Inc, [4]Department of Applied Biological Chemistry, Graduate School of Agricultural and Life Science, The University of Tokyo

IS4-3 16:20 – 16:45

The effect of single nucleotide polymorphisms of GPR120 on detection threshold, liking and fattiness ratings of oleic acid

Keiko Yasumatsu[1,2]

[1]Tokyo Dental Junior College, Japan, [2]Monell Chemical Senses Center, USA

■ Closing remarks 16:45 - Masahiro Yamaguchi (*Kochi Univ*)

[Discussants]

Hiroaki Matsunami (*Duke Univ*), Lindsey Schier (*Univ Southern California*), JaeHyung Koo (*SGIST*), Moon SJ (*Yonsei Univ*), Jeong YT(*Korea Univ*), Rhyu MR (*Sejong Univ*), Yamamoto T (*Kio Univ*), Emoto K (*Tokyo Univ*), Uneyama H (*Ajinomoto*), San Gabriel A (*Ajinomoto*), Kondoh T (*Kindai Univ*), Iwatsuki K (*Tokyo Univ Agri*), Imai H (*Kyoto Univ*), Yamashita A (*Okayama Univ*), Sanematsu K (*Kyushu Univ*), Yamaguchi M (*Kochi Univ*), Imai T (*Kyushu Univ*), Fukutani Y (*Tokyo Univ Agri Tech*), Fukuda N (*Niigata Univ*), Fujimoto S (*Kyushu Univ*), Ogino T (*Nagoya City Univ*), Yasumatsu K (*Tokyo Dent Jr College*), Inui-Yamamoto C (*Osaka Univ*), Inui T (*Hokkaido Univ*), Kido M (*Saga Univ*), Kondo H (*Tokyo Inst Tech*), Taruno A (*Kyoto Pref Univ Med*), Hirota J (*Tokyo Inst Tech*), Ozaki M (*Kobe Univ/Nara Women's Univ*), Wakisaka S (*Kansai Women's Col*), Hayashi Y (*Kyoto Univ*), Yasuo T (*Asahi Univ*), Iwata S (*Asahi Univ*), Yoshimoto R (*Saga Univ*), Toyono T (*Kyushu Dent College*), Ohkuri T (*Suntory*), Masuzawa Y (*Ajinomoto*), Kohmura M (*Ajinomoto*), Maruyama Y (*Ajinomoto*), Takumi A (*Ajinomoto*)

■ Poster Session

ISP01
Combinatorial orthosteric and allosteric interactions of an odorant receptor
Shigenori Inagaki, Kohei Fukata, Biswanath Saha, Takeshi Imai
Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan

ISP02
Submodalities of intestinal chemical senses studied with *in vivo* Ca^{2+} imaging of the nodose petrosal ganglia neurons
Hikari Takeshima[1], Keisuke Ito[2], Hideki Enomoto[2], Takeshi Imai[1]
[1]Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan, [2]Division for Neural Differentiation and Regeneration, Department of Physiology and Cell Biology, Kobe University Graduate School of Medicine, Kobe, Japan

ISP03
An attempt to understand the molecular mechanism underlying toothpaste-mediated taste-modification
Chiaki Taketani[1], Koujirou Hashizume[2], Keiichi Yoshikawa[1]
[1]Kao Corporation, Sensory Science Research, Japan, [2]Kao Corporation, Biological Science Research, Japan

ISP04
Identification of Cibacron Blue 3G-A as an inhibitor of Otopetrin 1 (OTOP1), a sour sensing proton channel
MD Mominul Islam[1], Omi Sasaki[1], Saori Yano-Nashimoto[1], Yuko Okamatsu-Ogura[2], Soichiro Yamaguchi[1]
[1]Laboratory of Physiology, Department of Basic Veterinary Sciences, Faculty of Veterinary Medicine, Hokkaido University, Sapporo, Japan, [2]Laboratory of Biochemistry, Department of Basic Veterinary Sciences, Faculty of Veterinary Medicine, Hokkaido University, Sapporo, Japan

ISP05
Correlation between the functional polymorphisms in TAS2Rs and human bitter taste perception for caffeine
Rena Numabe[1,2], Hiroo Imai[2]
[1]Division of Biology, Graduate School of Science, Kyoto University, [2]Center for the Evolutionary Origins of Human Behavior, Kyoto Univ., Inuyama, Japan

ISP06
Enantiomers of organic acids are identified by the preference taste receptors Tas1R2/Tas1R3 or Tas1R1/Tas1R3
Yuko Yamase[1,2], Hai Huang[2], Yoshihiro Mitoh[2], Kengo Horie[2], Ryusuke Yoshida[2]
[1]Department of Dental Anesthesiology and Special Care Dentistry, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University, Japan, [2]Department of Oral Physiology, Graduate School of Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University, Japan

ISP07
Ligand-binding analysis of the ligand-binding domain of taste receptor T1r2a/T1r3 from medaka fish
Hikaru Ishida, Norihisa Yasui, Atsuko Yamashita
Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University, Japan

ISP08
Chemosensory studies using organoids: from monkey to human
Shinsuke Matsui[1], Tatsuya Kometani[1], Marie Shinohara[2], Akihiko Inaba[3], Hiroo Imai[3], Ken Iwatsuki[1]
[1]Department of Nutritional Science and Food Safety, Faculty of Applied Biosciences, Tokyo University of Agriculture, [2]Department of Bioengineering, School of Engineering, The University of Tokyo, [3]Molecular Biology section, Center for the Evolutionary Origins of Human Behavior, Kyoto Univ., Japan

ISP09
Ccn3 expression in the murine taste bud does not confer essential roles in taste perception
Kuanyu Wang, Yoshihiro Mitoh, Kengo Horie, Ryusuke Yoshida
Department of Oral Physiology, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University, Japan

ISP10

The neural mechanism regulating psychological stress-induced sweet taste modification

Mayui Tanaka[1,2], Rattanajearakul Nawarat[3], Shiki Okamoto[4], Yasuhiko Minokoshi[2], Takumi Misaka[1], Ken-ichiro Nakajima[2,3]

[1]Department of Applied Biological Chemistry, The University of Tokyo, [2]Division of Endocrinology and Metabolism, National Institute for Physiological Sciences, [3]Department of Applied Biosciences, Nagoya University, [4]Department of Medicine, Ryukyu University

ISP11

The effect of fatty acids and involvement of GPR120 on sweet taste in mouse chorda tympani nerve

Kasumi Hata[1], Junko Nakajima[1], Nobuyuki Matsuura[1], Keiko Yasumatsu[2,3]

[1]Department of Oral Medicine and Hospital Dentistry, Tokyo Dental College, [2]Tokyo Dental Junior College, [3]Monell Chemical Senses Center

ISP12

Hormonal effects on the salt preference in the dietary zinc-deficient female rat

Chizuko Inui-Yamamoto[1], Saki Nishihara[2], Shogo Yoshimatsu[2], Akiyo Kawano[1,3], Makoto Abe[1], Takashi Maeda[1], Shinsuke Ohba[1], Satoshi Wakisaka[1,4]

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ISP13

Enhancement of umami taste by Na ion in humans

Kana Tanaka, Haruka Katsuragawa, Takashi Kondoh

Department of Food Science and Nutrition, Faculty of Agriculture, Kindai University, Nara, Japan

ISP14

Enhancement of sweet taste by NaCl in humans

Takashi Kondoh, Yui Katsumata, Kyoka Yoshitake

Department of Food Science and Nutrition, Faculty of Agriculture, Kindai University, Nara, Japan

ISP15

The Oral Metabolic Signaling Pathway for the Polyol Sweeteners Sorbitol, Allulose, and Erythritol is inhibited by Phlorizin

Tadahiro Ohkuri[1], Paul A.S. Breslin[2], Linda J. Flammer[2], Robert F. Margolskee[2], Nancy E. Rawson[2], Anilet Tharp[2], Akiko Izumi[1], Yoshiaki Yokoo[1]

[1]Suntory Beverage and Food Ltd, Tokyo, Japan [2]Monell Chemical Senses Center, PA, USA

ISP16

Capsaicin enhances the mouse chorda tympani nerve responses to sugars and salt

Shusuke Iwata[1], Shinpei Takahashi[1], Toshiaki Yasuo[1], Takeshi Suwabe[1], Noritaka Sako[1], Yuzo Ninomiya[2,3]

[1]Dept. Oral Physiol. Asahi Univ. Sch., [2]Dept. of Oral Physiol., Grad. Sch. of Med., Dent., and Pharm. Sci., Okayama Univ., [3]Monell Chemical Senses Center

ISP17

Lick rates, number of taste buds and mRNA expression levels of taste-related molecules during vitamin B2 deficiency

Toshiaki Yasuo, Shusuke Iwata, Takeshi Suwabe, Shinpei Takahashi, Noritaka Sako

Department of Oral Physiology, Asahi University School of Dentistry, Japan